FREE HAND DRAWN SMS – METHOD & DEVICE

INTRODUCTION

This patent is about enabling a handset user to create an SMS message using free hand writing. This patent enables sending an image drawn by the user or also identifies the hand writing as characters. Thus, enabling an easy creation of complicated characters such as Chinese characters. This invention also eliminates the complicated use of a small handset keyboard. This invention fits for second-generation cellular devices as well as more advanced sets of 2.5G and 3G (third generation). The innovation of this patent is that this invention general and fits all handsets and also is a very low cost solution (several dollars) at each handset. Thus, there is no need to make special major adaptations for various cellular handsets.

FIELD OF INVENTION

This invention is in the mobile handset field. Also, this invention fits into the SMS and EMS (Enhanced SMS) field and Image messaging.

PRIOR ART

Using free hand writing or drawing is popular when speaking about PDAs. Such devices are quite expensive and complicated when compared to a conventional cellular handset (2G –second generation handsets). Other devices fit to cellular handsets but they are special for each handset i.e. these devices are connected to handset's external connector which is proprietary for each handset. Furthermore, existing solutions require the attachment of external modules that are not small neither cheap.

DISADVANTAGES OF EXSISTING SOLUTION

Existing solutions are not general for every handset, neither are they cheap when compared to the cost of a cellular handset. Furthermore, existing solutions require attachments of modules, which are not small if compared to a size of a handset. PDAs do not require any attachments but PDAs cannot send free hand drawn images as SMS for second generation of cellular phones. Furthermore, the PDAs are quite expensive when compared to regular second generation cellular handsets. Existing 2G as well as 2.5G phones do not provide a simple way of typing alphanumerical characters. Furthermore, this is even more complicated when far east characters are concerned e.g. Chinese characters.

DESCRIPTION OF THE INVENTION

BLOCK DIAGRAM

Block Diagram 100 – The Handset Side

I just want to verify : Is this limited to GSM hand set ? or maybe we should refer to GSM enabled instrument (?). As you know some of the PDA have handset capabilities. I agree, we should refer to GSM enabled instruments as well. The only limitation is the necessity to have a SIM card and a BUS between the SIM card and the micro processor of a handset – based on GSM 11.11 and 11.14 standards.

Block Diagram (100) describes the handset side of the invention. Every GSM handset (30) includes a micro processor (40), which acts as a master micro processor. In addition every cellular GSM handset (30) includes also a SIM card (50). The SIM card also includes a micro processor that acts as a slave micro processor. The master micro processor (40) and the SIM card (50) communicate according to GSM standard 11.11 which is also known as ETSI TS 100 977 document.(Give more reference. What is the full name of ETSI) ETSI stands for European Telecommunications Standard Institute. TS stands for technical specification. All ETSI standards can be found at WWW.ETSI.ORG. In fact, this standard is implemented in all GSM ver. 2+ phones and this is the enabling factor of this invention.

According to this standard, it is possible to write and store a short message in the SIM card (50). The Mobile Equipment (ME) which is the cellular handset (30) controlled by its micro processor (40) in this case, can initiate an SMS creation. This invention buffers the communication between the micro processor (40) and the SIM card (50) as far as short messages related communication is concerned. The buffering device is the

Intermediate Smart Card (ISC) (80). This device is connected in front of the SIM card (50), by using the SIM connectors (70). The ISC (80) will store, create and provide the micro processor (40) with short messages – instead of the SIM card (50). In fact, the user can use the pad (10) for creating a free hand drawn or written message. This message will be stored within the Intermediate Smart Card (80). The user will give the send command by using the handset's (30) keys.

It should be noticed that the pad (10) will be operated by a simple writing device such as a simple pen or pencil (20) that do not need any writing capabilities except the pressure that they provide on the pad (10). The free hand writing can include text characters or free hand animation or both. The system will include an OCR – a device that recognizes text characters out of hand writing. (give some examples of existing OCRs. We should refer to ART's OCR Look at their web-site and see what you think is worth inserting. http://www.artcomp.com/ There are existing OCRs such as Palm Pilot or OCR manufactured by ART http://www.artcomp.com/. However, the OCR within Palm Pilot requires a specific hand writing that should be adapted. The OCR developed by ART should be inserted within a handset in a proprietary way, specific to each handset. Furthermore, the input device is using the external connector of a handset which is proprietary for each handset and also disables the usage of hands free device.

Block Diagram 200 – The Structure of the Pad

The pad (10) is the input means of the system: The pad is location sensitive. This means, that when pressed, written on or moved, it send data containing the location where "action" where taken. There are several items of this type which may suit implementation of this invention. Among these are writing pads ([Moshe – this kind of pads probably have a general name – do you know it ?? – I am not familiar with such a name. Usually such pads are proprietary for Palm like devices. Nevertheless, such devices as Palm are using quite expensive pads that also include a dispay. – I agree with the rest of this paragraph.], touch screens, optical mouse (in mouse or pen shape) and others. sent it It may also have designated areas with assigned application. Namely, when such designated area is activated, the pre-designated

command is sent (or if the designated area is activated, the system interprets it as the pre-programmed command associated with this specific area or location.

A non limiting example of the structure of this pad is as follows:

The pad (10) has a free hand writing area (220). The user can write or draw any object here and in any language he chooses. In order to create a message, the user has to press the create (230) button before he begins drawing or writing. In case the user would like an OCR operation on his drawing / writing, he would have to press the Text Included button (240). The content of the drawing / writing will be stored within the ISC (80), therefore, in order to see this content on handset's display, the user will have to press the Display button (250). Without limiting this invention, a display of the animated message is possible by the usage of a proactive SIM application Toolkit command. SIM Application Toolkit is defined in GSM standard 11.14 (ETSI TS 101 267). By such a command, the ISC (80) asks the micro processor (40) for getting the control of the display of the handset and write to it. In such a way the micro processor (40) hands over to the ISC (80) the control on the display of the handset.

When finished with creation of the message to be sent, the user has to store it and therefore he has to press the Message Ready for Sending (260) button. Furthermore, the default language of the OCR will be the language of the handset. QU: The OCR is not in the pad, so why is it discussed here ?

The OCR is mentioned here because on the PAD there is a button that enables the user to choose a language that the OCR has to work with.

Nevertheless if the user needs to send a free hand text message in another language, he can do it by pressing the Language button (270) on the pad (10), and then he would have to specify the language by free hand writing.

The pad can be a cheap foil that will be connected to a handset (30) by glue or equivalent means .

Another input instrument you should refer to is "pen style" mouse that has an infra red link. This can communicate with most new handsets and pass the information.

If you know more about how it works – you can enhance the invention.

It should be mentioned that a device that is a "pen style" mouse that has an Infra Red link and can communicate with most new handsets also enables free hand input to a handset. However, such a device is handset proprietary, needs special adaptors that are proprietary connected to a handset and are quite expensive. Also there is no

standard for internal communication within a handset for getting information from the infra red device when it gets through the infra red device into the handset. Also, there is a solution made by Pegasus Israel that uses ultrasonic devices that are connected to an external connector of a handset (in a proprietary method), an ultrasonic device is put on a pen and in such a way the movement of the pen can be monitored and translated to a picture and then an OCR is run on it. Finally, the message is sent as a fax. This solution requires a very expensive device at the side of the handset, hard for carrying and handset dependent solution.

Block Diagram 300 – Architecture of the Intermediate Smart Card (ISC)

Without limiting this invention, it should be mentioned that the ISC can be integrated within a SIM card enabling the usage of only one card instead of two cards - a SIM and ISC.

The ISC has to divide the free hand created message to smaller messages of the maximum size allowed by SMS standard (160 characters in current implementation). This quantization will be done within the Quantizator (320) module. There might be a case that the message is still before the recognition of its characters by the OCR (330) that can be placed within the ISC (80) or within the Server (440). In such case or in the case that the message does not include characters at all but only animation, the message should be encoded before quantization and sending. This is done by the encoder module (350).

Moshe – please re-write it "top down". I would add a flow diagram specifically for this decision pass. Looking at the process diagram you have attached these are the items in 1090-1110. you use there words (if / or) instead of putting a flow, which makes it hard to understand). OK WILL DO – SEE ATTACHED DRAWING. The server (440) will read and decode this message and also will be able to run OCR on it (in case the OCR is located within the server (440).

The ISC (80) also includes a memory module (340) that stores all SMS created and received. In fact, when the micro processor (40) of the handset (30) is looking for, writing or reading an SMS from the SIM card (50), it will get it from the memory module (340) of the ISC (80)., The OCR module (320) can be omitted from the ISC (80) and placed at the server (440) or be part of the ISC.

In a preferred implementation of this invention the ISC (80) can be a very thin card that is installed in the space between the battery and the handset (30) in a way that will suit the majority of handsets. [Any chance of preparing a photograph showing it?] please see attached within the attached presentation. The free hand content should be in a resolution that fits the display of the cellular handset (30) or in a way that will fit the lowest resolution of popular phones – in order to assure interoperability with most GSM existing phones.

When the handset (30) receives a message from the Free Hand Messaging server (440) the message can be encoded. Therefore, the ISC (80) includes a decoding module (360). If a regular SMS is received the ISC (80) wont be involved in a substantial way, though it might provide storage for it instead of the SIM card (50), so that the memory could be enlarged.

Block Diagram 400 – Integration within the Cellular Network

In fact, in order to enable this service of free hand created SMS and other features such as free hand animation messages or picture messages, a server (440) is added to the SMSC (430). Such server can provide OCR services, may have OCR capability in many languages, etc. The architecture presented here includes basic elements of the GSM network: Base station (450) that does the radio communication with the handsets (30), MSC (420) that is the switching device, the SMSC (430) that is the server that provides the SMS services and the innovative Free Hand Messaging Server (440) that will be connected to the SMSC.

Block Diagram 500 – The Structure of the Free Hand Messaging Server

The Free Hand Messaging Server (440) includes the OCR module (520). This module can identify characters drawn by free hand and sent encoded to the server (440). This server can decode the messages by using the decoding module (540). The server (440)

also includes an interface module (510) to SMSC. This module is responsible for the communication with the SMSC server. In case that the free hand messaging server (440) has to send a large message that includes more than one 160 character based message, the server (440) includes a concatenation module that will provide the SMSC with concatenated messaging that have to be sent as one.[add something about existing concatenation modules in 2G. I see we both listened to the same lecture] This will be important especially with the EMS (Enhanced SMS) service.{I am not sure it is important to say this sentence. If you can specify a unique feature – do it.).
It is possible to add a header at the beginning of the first SMS, saying that this SMS is the first one of a set. It is also possible to have binary data within such SMS, instead of a text.

THE PROCESS

Flow charts (1000) & (2000) describe the process of the invention.

The Process - MO (Mobile Originated)- 1000

Please re-read it. Break the process to simpler parts. Avoid and or sentences within a single block. This will make it more comprehendable. OK – NEW TEXT AS WELL AS NEW DRAWING.

The user activates Messages Creation Menu on his cellular phone (30) **(1020).**
The handset (30) is waiting for message creation in order to store it in the SIM card (50) or send it via the cellular network (410) **(1030).**
The user presses the Create button (230) on the pad (10) in order to begin drawing or writing a message **(1040).**
In order to tell the system that it should look for a text in the free hand message, the user should press the Text Included (240) button on the pad (10) **(1050).**
The user enters a free hand drawing or writing by using the pad (10) **(1060).**
When finished drawing / writing the message the user can press the Message Ready for sending button (260) in order to notify the ISC (80) that it can store this message as a ready one **(1070).**
When message defined as a ready message (1070), the user can press the display button (250) in order to see his drawing on the display of the handset (30) **(1080).**

When message defined as a ready message (1070), the user can specify a different language for the text he has entered. This should be done by pressing the Language button (270) on the pad (10). This means that the system will try to identify the text characters by using a dedicated OCR to the language that was specified by the user. The default language is the language that the handset (30) was configured to work in **(1090).**

The created message can go through OCR that optionally can be located within the ISC (80) or later in the server (440). (3000). If the OCR is located within the ISC **(3010).** The created message goes through OCR that is located within the ISC (80) **(3100).** The message should be encoded and quantified into MAX size of 160 characters. This will be done in the ISC (80).**(3110).** These Quantified messages should be given a tag of messages that should be sent. Such tag will be understood by the microprocessor of the handset (30) in order to send them in a concatenated way. **(3120).** The user should initiate the sending of the message he has created by entering the send message menu on his handset device (30). He will see new ready message waiting to be sent. This is because the ISC (80) has provided the microprocessor (40) with this information.

Now the user should press send message in the menu mentioned above. **(3130)** . The message will be sent to the messaging server - the SMSC (430) which will forward it to the Free Hand Messaging Server (440). There, the message will be decoded **(3140).** The message will forwarded back to the SMSC (430) for forwarding it further to its destination. **(3150).** If the OCR is not located within the ISC **(3010),** but within the Free Hand Messaging Server (440), **(3020)** A notice about the language of the message should be provided to the server (440) encoded within the message. **(3200).** The message should be encoded and quantified into MAX size of 160 characters. This will be done in the ISC (80). **(3210).** These Quantified messages should be given a tag of messages that should be sent. Such tag will be understood by the microprocessor of the handset (30) in order to send them in a concatenated way **(3220).** The user should initiate the sending of the message he has created by entering the send message menu on his handset device (30). He will see new ready message waiting to be sent. This is because the ISC (80) has provided the microprocessor (40) with this information.

Now the user should press send message in the menu mentioned above. **(3230)** . The message will be sent to the messaging server - the SMSC (430) which will forward it

to the Free Hand Messaging Server (440). There, the message will be decoded **(3240).** The message will be OCR checked **(3250).** The message will forwarded back to the SMSC (430) for forwarding it further to its destination. **(3260).**

If the OCR is located within the server (440) then a notice about the language of the message should be provided to the server (440) encoded within the message **(1100).**
In case the message is not going through OCR in the ISC (80), the message should be encoded and quantified into MAX size of 160 characters. This will be done in the ISC (80) **(1110).**

These Quantified messages should be given a tag of messages that should be sent. Such tag will be understood by the microprocessor of the handset (30) in order to send them in a concatenated way **(1120).**
The user should initiate the sending of the message he has created by entering the send message menu on his handset device (30). He will see new ready message waiting to be sent. This is because the ISC (80) has provided the microprocessor (40) with this information.
Now the user should press send message in the menu mentioned above **(1130).**
The message will be sent to the messaging server - the SMSC (430) which will forward it to the Free Hand Messaging Server (440). There, the message will be decoded, OCR (optional) checked and forwarded back to the SMSC (430) for forwarding it further to its destination **(1140).**

The Process - MT (Mobile Terminated) - 2000

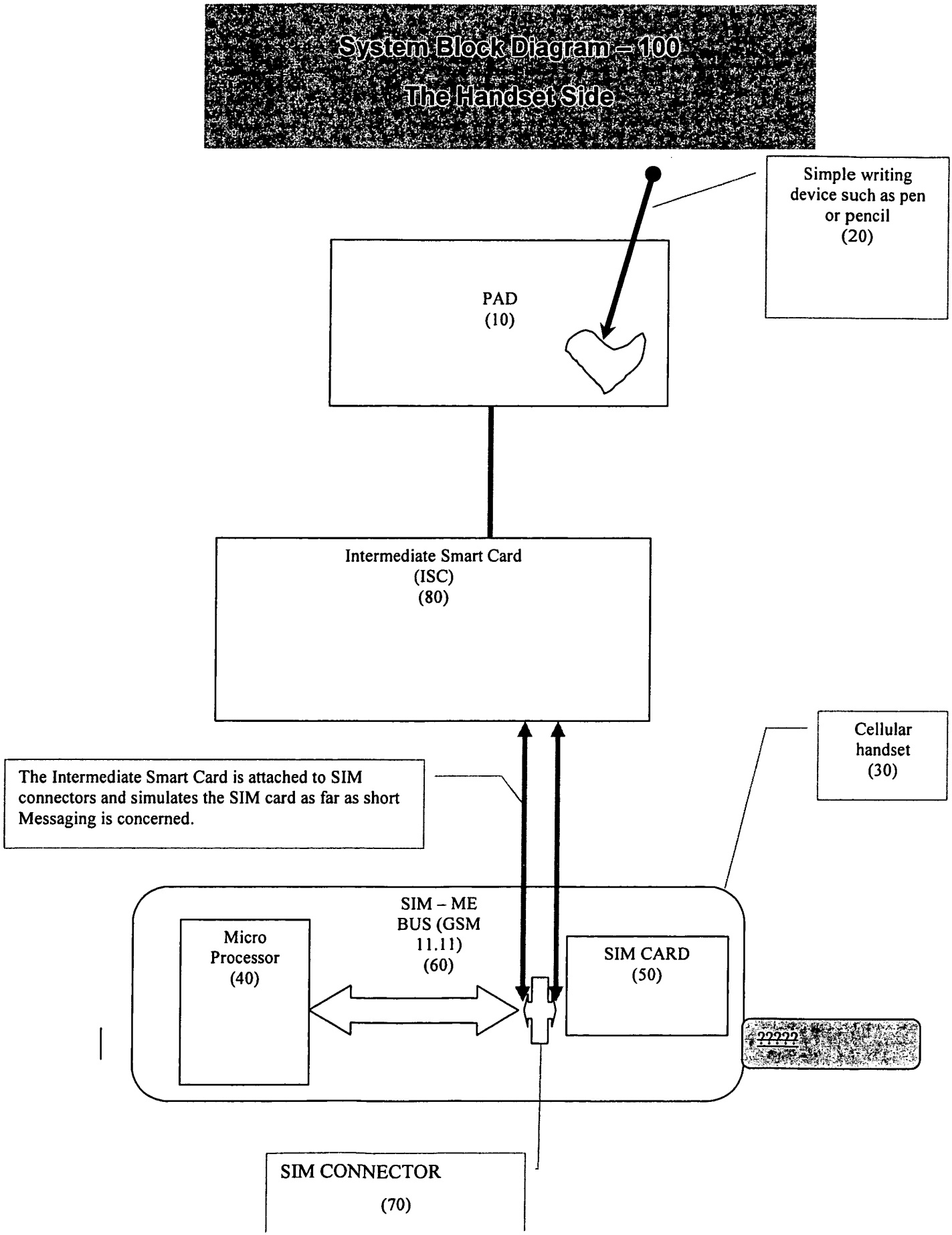
A Short Message (SMS) has arrived to the cellular handset **(2010).**
The message normally will be sent to the SIM card (50) for storage, However, in this case because of the ISC (80) that is located between the micro processor and the SIM (50) card, the message will be moved to the ISC (80) while the microprocessor (40) 'thinks' the message has been sent to the SIM card (50) for storage **(2020).**
The ISC (80) will decode the message it has received from the Free Hand Messaging Server (440). In case the message was a regular SMS the ISC (80) wont be involved. However, it might provide storage for it instead of the SIM card (50) memory – so that the total available memory in the handset could be enlarged **(2030).**

The messages received and stored within the ISC (80) can be accessed by pressing relevant keys is the handset as if a received SMS message should be read. The user is free to decide to see the received message **(2040).**

INOVATIVE STEPS

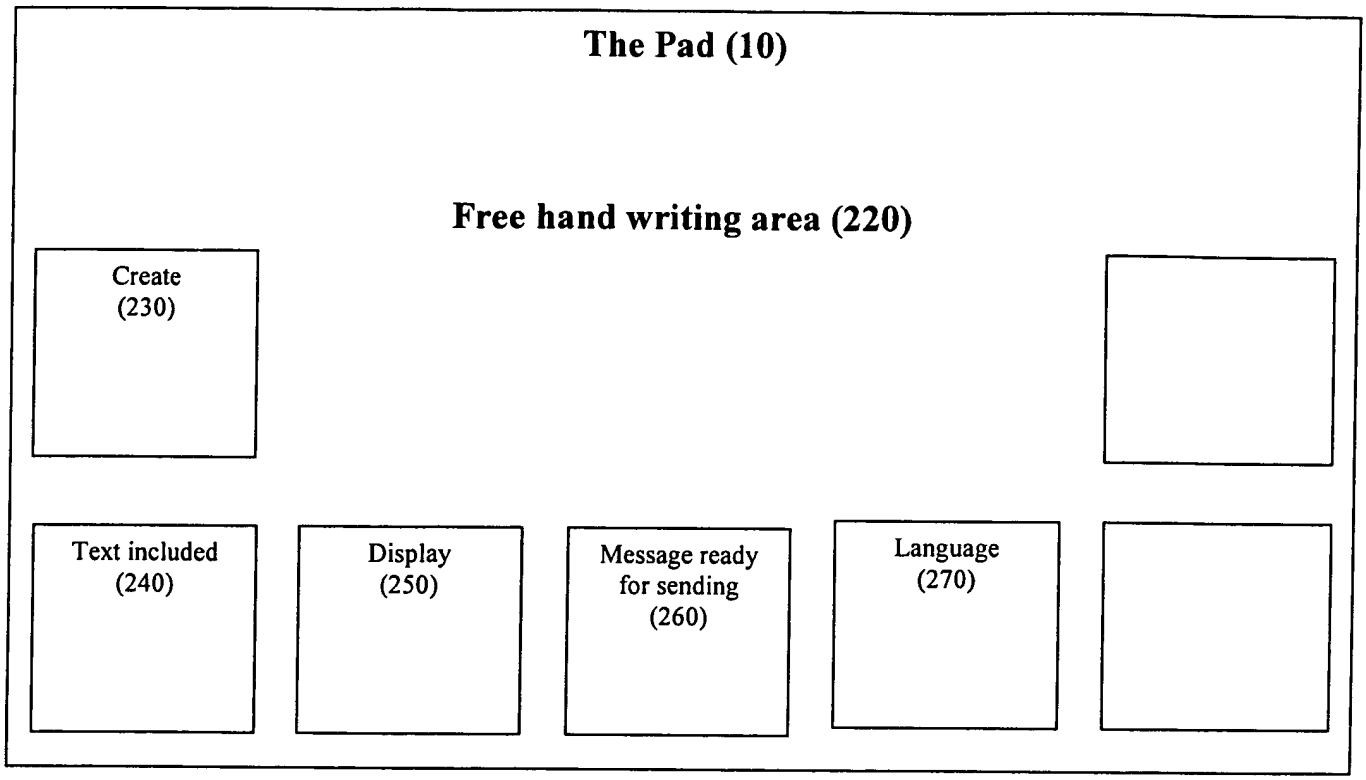
- This invention includes new method and device for free hand SMS drawing or writing.
- This invention is aiming to the common base that unifies all GSM handsets – the SIM card and the access to it. This is the innovative step taken to insure independency of handsets proprietary features.
- This invention enables to divide a bitmap (or other format) image into few 160 character based SMS while sending them to a SMS server that will use an OCR recover the characters.
- This invention uses a small PAD that can be easily glued to a handset and will enable free hand drawing or writing input.
- This invention involves a substantially low cost solution at the handset side for free hand SMS.
- This invention enables to create an SMS that includes text and animation written / drawn by a free hand.
- This invention enables picture messaging with handset independency.

DESCRIPTION of the INVENTION (DRAWING)



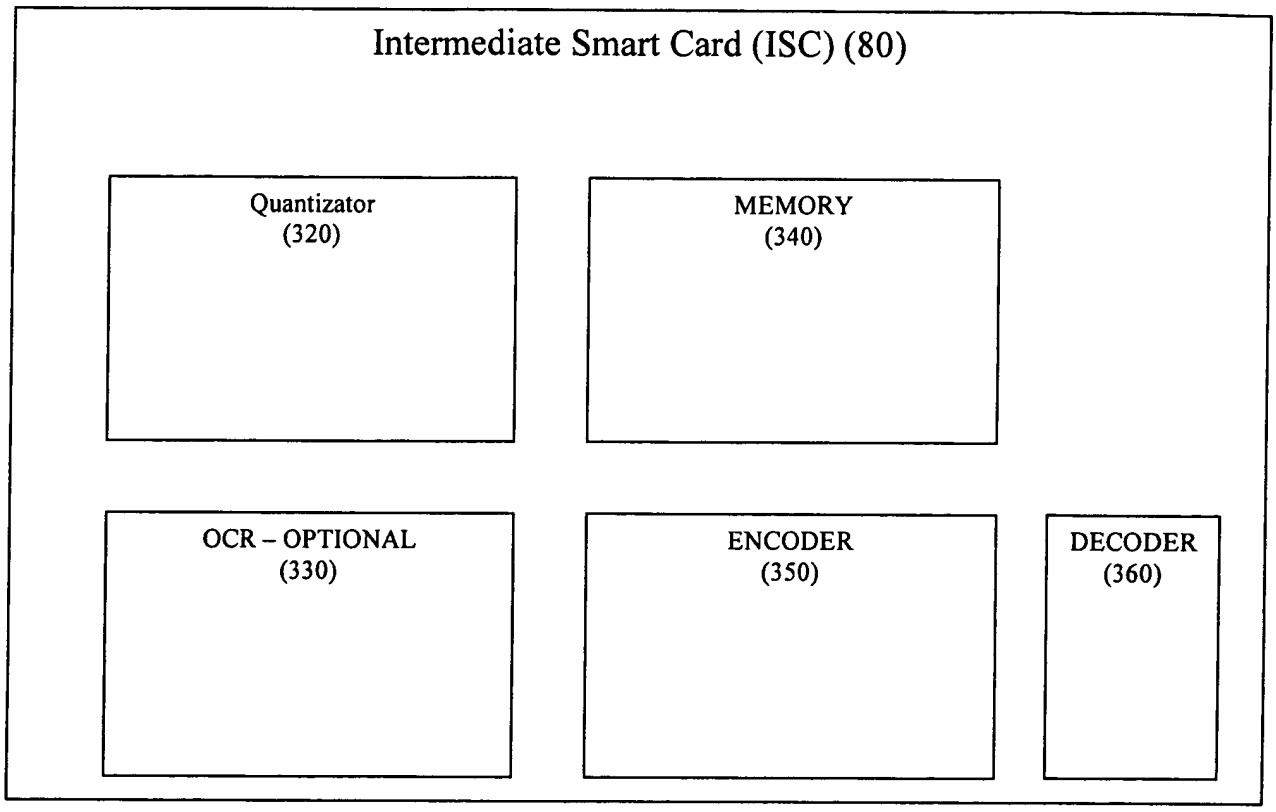
System Block Diagram – 200

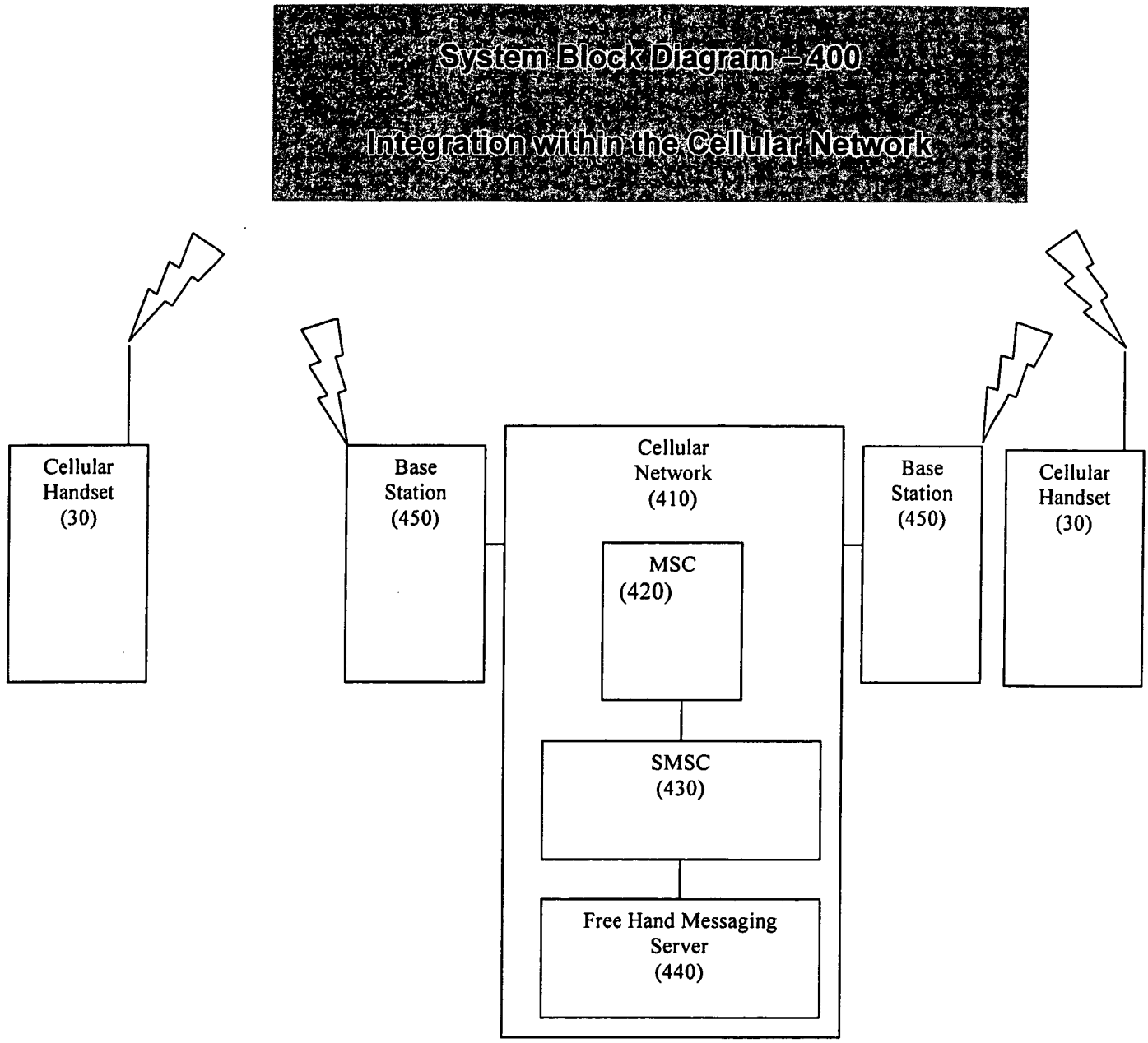
Possible structure of the Pad



System Block Diagram – 300

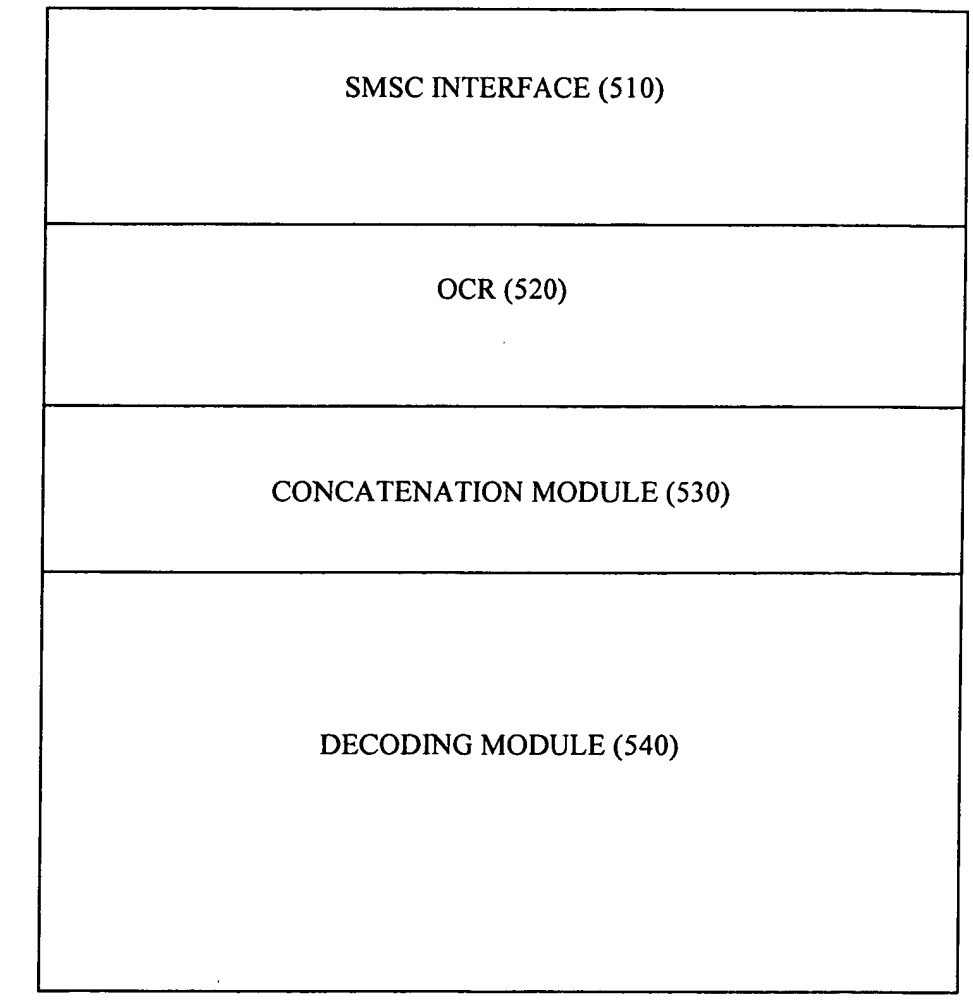
Structure of the Intermediate Smart Card (ISC)




System Block Diagram – 400
Integration within the Cellular Network
Cellular Handset (30)
Base Station (450)
Cellular Network (410)
MSC (420)
SMSC (430)
Free Hand Messaging Server (440)
Base Station (450)
Cellular Handset (30)

System Block Diagram – 500

Free Hand Messaging Server - Structure



HERE THE FLOW CHART DOCUMENT SHOULD BE ADDED